

Habitat preferences of the Hook-billed Bulbul *Setornis criniger* and the White-throated Babbler *Malacopteron albogulare* in Borneo

FREDERICK H. SHELDON

The Hook-billed Bulbul *Setornis criniger* and White-throated Babbler *Malacopteron albogulare*, two forest birds of Borneo, Sumatra, and (in the case of *M. albogulare*) peninsular Malaysia, are of patchy distribution and apparent rarity. However, accumulated evidence from fieldwork by the author and from the literature, museum skins, and unpublished records of other workers suggests that, in Borneo at least, both species prefer peatswamp forest, with *M. albogulare* also occupying floristically similar and often adjacent heath or other poor-soil forests. Speculation is made regarding the preference of these species for peatswamp forest in peninsular Malaysia and Sumatra, although *M. albogulare* is known from "typical" lowland forest in the former. The conservation of these species in Sabah (and probably most of Borneo) will depend on protection of the limited areas of peatswamp.

In discussions of tropical bird distributions, it is common for researchers to classify habitats using broad criteria. Thus, we speak of birds that live, for example, in lowland, upland, montane, savanna, mangrove, secondary, and primary forests. Each of these major forest categories, however, comprises a mixture of discrete habitats. These are usually defined approximately by their major component plant species, and their characteristics are strongly influenced by such factors as geological history, soil type, drainage, adjacent habitats, and human disturbance. Ornithologists, birdwatchers, and conservationists need to recognize the small differences among habitats, because fine details of forest structure and composition will often influence bird distribution and relative abundance.

Two examples of birds which are usually said to live in 'lowland' forests, but which probably occur mainly in forests defined by specific soils and flora, are the Hook-billed Bulbul *Setornis criniger* and the White-throated Babbler *Malacopteron albogulare*. Little is known about these birds, and less has been written, largely because of the specificity and patchiness of their distributions.

BACKGROUND

While participating in two surveys of the birds of Sabah, East Malaysia – one in 1976–1977 (Yale University) and one in 1981–1983 (Western Foundation of Vertebrate Zoology [WVZ]) – I became interested in *Setornis* and *M. albogulare*. Even though I spent many months netting and observing

birds in the forests of Sabah, I encountered these species only a few times. Further, I knew from publications and personal contacts that others who studied the birds of Sabah had recorded these species rarely. When the birds were located, and good field data were available, these species were almost always associated with forests growing on poor-quality soils (e.g. Wells 1976, Smythies 1981, Davies and Payne 1982).

To learn more about the Bornean distribution of these species, I examined specimens in the British Museum of Natural History, Philadelphia Academy of Natural Sciences, Sabah Museum, Sarawak Museum, Peabody Museum (Yale University), and University of Singapore Museum (Raffles Museum collection), and I collected data by correspondence from the American Museum of Natural History, Amsterdam Zoological Museum, Bogor Museum, Leiden Museum of Natural History, Museum of Comparative Zoology (Harvard University), and U. S. National Museum of Natural History.

Setornis criniger Lesson 1839

The Hook-billed Bulbul, also called the Long-billed or Van Bemmelen's Bulbul, occurs in Borneo, Bangka Island, and Sumatra (e.g. Chasen 1935, Smythies 1981). It was collected in eastern Sumatra in the early 1900s by W. L. Abbott, whose specimens are in the U. S. National Museum (Rand and Deignan 1960). The Sumatran sites are: the Siak River (10 December 1906), Kateman River (three specimens, September 1903), and Rupal Strait (27 February 1906). On Bangka it was collected at Klabat Bay. These are the only citations of van Marle and Voous (in press), who have made a thorough search for Sumatran records.

The Bornean records of *Setornis* are summarized in Table 1. The most informative are those of Wells *et al.* (1975), Wells (1976), Wells *et al.* (1978), and the WFVZ, and derive from two localities, Mt. Mulu National Park, Sarawak, and Merintaman-Menggalong Forest Reserve, near Sipitang, south-western Sabah. In both locations, *Setornis* occurred only in peatswamp forest. The birds of Mulu were found in the *Shorea albida* facies of the *kerangas*-peatswamp forest, where peat overlays sand.

In Sabah, this species was observed by D. M. Batchelor in the early 1960s (Smythies 1981, D. M. Batchelor *in litt.*), who encountered it in the Klias-Lumbidan region of the south-western coast. He described it as a rather active bird in the trees but not particularly vocal. It utters a harsh 'currrk', more guttural and hard than the call of the Yellow-vented Bulbul *Pycnonotus goiavier*. The white spots at the tip of the tail are conspicuous in flight, but otherwise this species could easily be passed over for one of the commoner bulbuls. Batchelor reports that one individual even entered his bungalow in search of spiders and their prey. The WFVZ survey saw an 'extremely noisy' flock of three birds fly out of the peatswamp forest at Menggalong, over a road, and into some roadside bushes. The white tail spots were particularly visible. Three birds were later netted together at ca. 1 m in the peatswamp forest.

Malacopteron albugulare (Blyth) 1844

The White-throated Babbler, also called the Grey-breasted Babbler, has been found on the Malay Peninsula, Borneo, Sumatra, and the Batu Island of Pini (Chasen 1935, Delacour 1947, Voous 1950, King *et al.* 1975, Smythies 1981). Voous (1950) summarized its plumage characteristics,

Table 1. Record localities of *Setornis criniger* in Borneo.

Locality	Notes
Kuching, Sarawak	35 specimens ^{1,2,7,8} ; 1891–1956; including specimens collected at mile 4 Stapok Rd., mile 3 Astana Rd., Kampang Sourbaya, and mile 10 Matang Rd; food: berries, small beetles, dragonflies, fly nymphs, insects, ants, and fruits.
Simanggang, Sarawak	2 specimens ^{1,7} ; virgin forest, in low trees; 5 July 1952, 12 Sept. 1952.
Lawas River, Sarawak	1 specimen ¹¹ .
Sungei Engkalat, Igan, Sarawak	1 specimen ¹ ; 27 Oct. 1950.
Similajau, Sarawak	1 specimen ¹ ; old jungle; 23 Jan. 1953.
Sadong, Sarawak	2 specimens ¹ ; old forest; 10 Aug. 1957.
Baram Dist., Sarawak	3 specimens ^{1,4,9} ; 1891, Dec. 1898.
Mt. Kalulong, Sarawak	1 specimen ³ ; Feb. 1893.
Sibu, Sarawak	3 specimens ⁴ ; 23 July 1874, 21 Nov. 1874, 1880s.
Bintulu, Sarawak	2 specimens ^{4,11} ; no date.
Mt. Dulit, Sarawak	1 specimen ⁴ ; 1880s.
Mt. Mulu, Sarawak	Net records ^{15,17,18} ; 27 Apr.–1 May 1978; found only in the <i>Shorea albida</i> facies of the Peatswamp-kerangas forest; its hoarse call showed it to be fairly common.
Tutong River, Brunei	3 specimens ⁹ ; Oct.–Dec. 1897.
Sempang, W. Borneo	3 specimens ^{5,9} ; 1900s.
Landak River, W. Borneo	1 specimen ⁵ ; 1900s.
Mt. Kenepai, W. Borneo	1 specimen ¹⁰ ; southern foot of the mountain, 11 Jan. 1894.
Kendawangan River, S. W. Borneo	1 specimen ⁵ ; 1900s.
Kapuas River, W. Borneo	5 specimens ^{5,10,11} ; 3 in 1845 and 2 in 1900s.
Pontianak, W. Borneo	2 specimens ¹⁰ ; 1826–1827.
Jpo. Opeloe Segedong, Pontianak, W. Borneo	1 specimen ⁶ ; 7 Apr. 1931.
Bandjermasin, S. Borneo	1 specimen ¹⁰ ; 1836.
Upper Mahakam, E. Borneo	1 specimen ¹⁰ ; May 1900.
Merintaman-Menggalong Forest Reserve, Sipatang, Sabah	Net records ^{13,14} ; 17–23 Mar. 1975; peatswamp forest.
Klias-Lumbidan Dist., Sabah	4 specimens ¹⁹ ; 15–16 July 1983; peatswamp forest; gonads minute. 1 specimen ¹¹ , no data. Sight records ^{15,16} , in abandoned rubber and thin forest; seen eating spiders, spider prey, berries, and small fruits; c. 1960.
Quoin and Kalabakan, Sabah	Sight record ¹² ; in pristine and recently cut primary forest; early 1960s.

Note: Many localities recorded prior to the 1970s are likely to be concocted, the labels having been written, for example, after local hunters brought birds to camp. Thus, most listings above are useful only in providing a general idea of collecting area. Specimens with vague localities, e.g. those saying simply 'Borneo' or 'Sarawak', have not been listed.

1 = Sarawak Museum; 2 = University of Singapore Museum; 3 = Sabah Museum; 4 = British Museum; 5 = U. S. National Museum; 6 = Bogor Museum; 7 = Peabody Museum; 8 = Museum of Comparative Zoology; 9 = American Museum; 10 = Leiden Museum; 11 = Everett (1889); 12 = Norman (1964); 13 = Wells *et al.* (1975); 14 = Wells (1976); 15 = Smythies (1981); 16 = D. M. Batchelor (*in lit.*); 17 = Wells *et al.* (1978); 18 = Anderson *et al.* (1982); 19 = WFVZ.

measurements and biogeography in a discussion of the evolution of the six species of *Malacopteron*. He came to the conclusion that *M. albogulare* is the most aberrant of the genus. Its plumage is the most distinct and, in terms of specimen numbers and collecting localities, it appeared to Voous to be rarer and to have a more disjunct distribution than its congeners.

Now that more is known about this species, Voous's (1950) conclusions can be amended to some extent. Two factors seem to have played a role in distorting our understanding of the abundance and distribution of *M. albogulare*. First, as will be discussed below, the apparent preference of this species for peatswamp forests, which are unpleasant places to work because of wetness and insect life, acted to reduce the number of specimens. (This source of bias applies to *Setornis* as well.) Second, *M. albogulare* is unaccountably difficult to find by observation. Hence, early collectors who depended on shooting would have obtained relatively few specimens. With the advent of mist-netting, the number of records has increased dramatically, and at least in peninsular Malaysia this species is now known to be commoner, for example, than the Sooty-capped Babbler *M. affine* (D. R. Wells, verbally).

In peninsular Malaysia, confirmed records exist from northern Trengganu to southern Johor (Voous 1950, Wells 1982). The type-specimen is purported to be from Singapore, but there is some doubt about this (e.g. Gibson-Hill 1949, Voous 1950), and the birds are certainly not there now. From Sumatra there are few records. The only specimens with locality data are from the Tasik River, Langkat (1919–1920); Pini Island (1896); and the Lingga Archipelago (Voous 1950, van Marle and Voous in press). Field observations have been made by F. G. Rozendaal at Panti, Barat (1980), and by D. A. Holmes at Bajubang, Jambi (1975) (van Marle and Voous in press).

The Bornean site records I have assembled are summarized in Table 2. Most of these records derive from specimen labels, the data of which are often old and inaccurate. Consequently, I have weighed the more recent, documented (by specimen or capture) records more heavily in attempting to assess the habitat preference of *M. albogulare*. Wells *et al.* (1978) found these birds to be common in the peatswamp and *kerangas* forest of Mulu Park, and not to occur at all in other habitats. The WFVZ survey observed *M. albogulare* and netted four individuals in coastal-Ramin swamp-forest (a kind of peatswamp forest) in the Merintaman-Menggalong Forest Reserve, Sabah (16 July 1985). The WFVZ also netted a single bird in a seven-year-old *Albizia falcataria* plot in the Sabah Softwoods's tree plantation north-west of Tawau, south-eastern Sabah (July 1982). The soil type at Sabah Softwoods was unknown to us, but appeared in retrospect to be the lateritic variety common to most of the Bornean lowland forest. The Softwoods's plantation was once dipterocarp forest contiguous with the Kalabakan forest where Norman (1964) reported having seen *M. albogulare*. However, months of extensive birding, netting, and collecting in the Quoin, Kalabakan, and contiguous lowland dipterocarp forest (now almost entirely logged) have never yielded a confirmed record of this species, other than that in the

Albizia (Thompson 1966, Yale University, WFVZ).

R. Sims and E. Banks collected a single specimen for the British Museum in 1956 at Gunong Ensuan, east-central Sabah. This region of Sabah consists of a mosaic of forest types, including forests growing on ultrabasic-alluvial outwash from the Tawai Massif and forests growing on podsols (*kerangas*). Davies and Payne (1982) observed *M. albogulare* in the same region as Sims and Banks, and because they were particularly interested in the effects of

Table 2. Record localities of *Malacopteron albogulare* in Borneo.

Locality	Notes
Kuching, Sarawak	35 specimens ^{1,2,5,7} ; 1892–1954; including specimens labelled as collected at miles 4–5 on Stapok Rd. and mile 10 on Matang Rd.
Similajau, Sarawak	2 specimens ¹ ; 24 Jan. 1953; old jungle, a pair on a treetop; food: ants.
Kalingkang, Sarawak	1 specimen ¹ ; 26 Oct. 1959; virgin forest on hill; food: hoppers and ants.
Matalun, Sarawak	1 specimen ¹ ; 10 Nov. 1955.
Long Akah, Sarawak	1 specimen ¹ ; 10 Feb. 1955; alt. 500 feet; food: insects.
Betong, Seribas, Sarawak	1 specimen ^{2,7} ; 8 Aug. 1916.
Belingian, Sarawak	5 specimens ^{2,7} ; 1902, 1903, and 1917.
Samarahan River, Sarawak	5 specimens ^{2,3,7} ; 13–23 Nov. 1919.
Mt. Dulit, Sarawak	2 specimens ³ ; Oct. 1898, 3000 feet; 17 Nov. 1932, in the 'moss forest'.
Lawas River, Sarawak	1 specimen ³ .
Bintulu, Sarawak	2 specimens ³ .
Niah, Sarawak	Net records ⁸ .
Semengoh Forest Res., Sarawak	Sight (?) record ⁹ .
Mt. Mulu, Sarawak	2 specimens ⁷ ; Oct. 1893, 1000 and 3000 feet. Net records ^{10,11,13} ; found only in the peatswamp- <i>kerangas</i> net sites.
Muara Tewe, S. Borneo	1 specimen ⁶ .
Kendawangan River, S. W. Borneo	3 specimens ^{4,7} .
Pontaniak, W. Borneo	2 specimens ⁷ ; 1826–1827.
Kapuas River, W. Borneo	1 specimen ⁷ .
Lumbidan, Sabah	1 specimen ⁶ .
Morutai Besar, Sabah	1 specimen ⁷ ; Harvard Univ. expedition 1937.
Gunong Ensuan, Sabah	1 specimen ³ ; 3 May 1956; 5°51'N 117°8'30"E; alt. 1000 feet.
Kuala Kunkun, Sabah	2 sight records ¹² ; 5 May 1980; seen independently by two individuals in two different habitats: forest on ultrabasic-alluvium soil and forest on podsols.
Sabah Softwoods, Sabah	1 specimen ¹⁴ ; 4°33'N 117°40'E; 28 June 1982; in the 7-year-old <i>Albizia falcataria</i> groves; testes 7 × 3 mm.
Merintaman-Menggalong Forest Reserve, Sipitang, Sabah	4 specimens ¹⁴ ; 16 July 1983; found in the mid-storey of the peatswamp forest; gonads minute.

Note: Many localities recorded prior to the 1970s are likely to be concocted, the labels having been written, for example, after local hunters brought birds to camp. Thus, most listings above are useful only in providing a general idea of collecting area. Specimens with vague localities, e.g. those saying simply 'Borneo' or 'Sarawak', have not been listed.

1 = Sarawak Museum; 2 = University of Singapore Museum; 3 = British Museum; 4 = U. S. National Museum; 5 = Peabody Museum; 6 = Everett (1889); 7 = Voous (1950), including specimen records from the American Museum, Museum of Comparative Zoology, Philadelphia Academy, Amsterdam Museum, Leiden Museum, and Brussels Museum of Natural History; 8 = Harrisson (1967); 9 = Fogden (1976); 10 = Smythies (1981); 11 = Wells *et al.* (1978); 12 = Davies and Payne (1982, verbally); 13 = Anderson *et al.* (1982); 14 = WFVZ.

different forest types on the distribution of fauna, they took care to note that the bird occurs both in *kerangas* and in forests lying on ultrabasic soils. Interestingly, this was the only locality, out of 35 survey sites, where Davies and Payne recorded *M. albogulare*. The WFVZ survey failed to find this species in a *kerangas* forest they surveyed at Sungei Labau, north-east of Sook (5°16'N 116°31'E), despite extensive netting.

In Brunei, C. F. Mann (*in litt.* 1987 to N. J. Collar) reports *M. albogulare* 'common in rain forest not far from Bandar Seri Begawan'. This population may also be associated with adjacent coastal swamp forest, however, and further data on the status of the species in the region will be most interesting.

In the field, *M. albogulare* has a bright white superciliary line and yellow lores that render its facial appearance reminiscent of some of the fantails *Rhipidura*. In birdskins, this eyeline is faded and unremarkable. The bird also has a notable grey hood, and its grey breast-band is vivid. Once found, the species is easy to identify.

DISCUSSION

Some general patterns of *Setornis* and *M. albogulare* distribution are indicated by the localities listed in Tables 1 and 2. Only Mt. Kalulong, Long Akah, and Sabah Softwoods (Kalabakan) are not located in, or adjacent to, obvious regions of extensive peatswamp and/or heath forest. Further, there are more than 10 localities where both species have been collected or reliably recorded, often by the same person at the same time. (These coincidental localities notably do not include Mt. Kalulong, Long Akah, and Kalabakan.) Taken as a whole, the records imply that, in Borneo, *Setornis* and *M. albogulare* prefer peatswamp forests to the commoner lateritic-soil, mixed-dipterocarp forests, and that at least *M. albogulare* also inhabits heath and contiguous forests growing on ultrabasic soils. Negative evidence of the habitat preference of these birds derives from the fact that, despite extensive netting and observation, neither has ever been recorded in Sabah's 'typical' mixed-dipterocarp forests. However, this is not to say that they do not occur in such forests in other parts of Borneo.

The characteristics of the various types of Sundaland forests are explained clearly and thoroughly by Whitmore (1984a). Peatswamp grows on acidic peat soils, usually over marine deposits, and comprises a catena of forest types, which lie in concentric formation and vary in physiognomy and flora. Heath forests are of two varieties, *kerangas* and *kerapah*: *kerangas* describes forests growing on podsols, *kerapah* forests where peat has accumulated on top of the podsols. The acidity of peatswamp and heath soils, the variety of peatswamp forest types, and the occurrence of peat in heath formations result in floral similarities between peatswamp and heath forests. In Borneo, for example, *Shorea albida* is often the dominant tree species in sections of both kinds of forest. Commonly, heath and peatswamp forests lie adjacent to

one another (Brunig 1974, Anderson *et al.* 1982, Whitmore 1984a).

The most extensive areas of peatswamp forest are in Borneo (c. 7.8×10^6 ha), north-eastern Sumatra (c. 9.7×10^6 ha), and coastal peninsular Malaysia (c. 0.5×10^6 ha), and they have not developed to a significant degree elsewhere in Western Malesia (Whitmore 1984a). Bornean peatswamp occurs mainly in the coastal lowlands of Sarawak and the western and southern coastal lowlands of Kalimantan (Whitmore 1984b). In Sabah, peatswamp is developed to a significant degree only in Merintaman-Menggalong Forest Reserve. There is a possibility that small formations occur elsewhere in the state, but data on habitat distribution are difficult to obtain (Whitmore 1984b).

Most Far Eastern heath forest occurs in Borneo, with lesser amounts on the east coast of peninsular Malaysia, east-coast Sumatra, and the islands of Bangka, Karimatas, Anambas, and Natunas (Brunig 1974, Whitmore 1984a,b).

The fact that the distribution of peatswamp and heath forests in Borneo coincides well with the distribution of *Setornis* and *M. albogulare* invites the speculation that these two birds species are likely to occur primarily in the peatswamp and related heath forests of Sumatra and (for *albogulare*) peninsular Malaysia. Indeed, in peninsular Malaysia, D. R. Wells (verbally) has found *albogulare* to be the dominant *Malacopteron* of peatswamp, but it is not at all restricted to such forest; it is found regularly by mist-netting in mixed-dipterocarp forest. The important criterion affecting its distribution appears to be that the forest be level and lowland. In Sumatra, van Marle and Voous (in press) suggest that *Setornis* and *M. albogulare* be sought in peatswamp and/or swamp forest. All of the Sumatran records of *Setornis* are from lowland, swamp-dominated areas. Some of the specimens of Sumatran *M. albogulare* clearly were collected in swampy regions, but others, e.g. those from Pini and the Lingga Archipelago, may or may not have come from swamp or heath.

The small difference in habitat preference between the Bornean and peninsular Malaysian (and Sumatran?) populations of *M. albogulare* is possibly the result of a difference between total avifaunas in those two places. Variation in numbers and types of species would affect the ecological parameters (e.g. niche dimensions) dictating habitat requirements. For example, a reduction in the extent of competitive interactions between *M. albogulare* and its congeners or ecological equivalents in peninsular Malaysia could have resulted in more relaxed habitat requirements for mainland populations, thus allowing them freer use of mixed-dipterocarp forest.

The Bornean, Sumatran and (for *albogulare*) peninsular Malaysian representatives of *Setornis* and *M. albogulare* are similar in morphology as well as in habitat preference. *Setornis* is not divided into subspecies, and the two subspecies of *M. albogulare* (*albogulare* and *moultoni*) are virtually indistinguishable (Voous 1950). These similarities are likely to be the result of recent population vicariance caused by rising sea-level. Peatswamp formation is believed to require special conditions of nutrient-poor alluvium

overlying salt and sulphide-rich clays (as occur on the inland side of seaward-advancing mangroves). Such conditions were likely to have been in place in Borneo, Sumatra, and peninsular Malaysia only since the Pleistocene, when sea-level changes were relatively common and alluvium was derived from sediment-based (as opposed to volcanic) highlands (Whitmore 1984a).

CONSERVATION

The poor quality of the soil in peatswamp and heath decreases the development potential of these kinds of forests (e.g. for agriculture). Nevertheless, the trees comprising peatswamp and heath formations are valuable, the land is often near the coast and easily accessible, and the unique features of these formations are not usually appreciated. The forests are, therefore, subject to logging, and this threatens bird species that are primarily dependent upon them. *Setornis* and *M. albogulare* inhabiting the Merintaman-Menggalong Forest Reserve of Sabah, for example, are in immediate danger. This reserve – which has the only good examples of coastal-Ramin swamp-forest in Sabah and the last stands of the Borneo camphor *Dryobalanops aromatica* (W. Meijer *in litt.*) – was once part of the Klias National Park. It has since been de-gazetted and is now part of a wood-products concession and is expected to be cleared and replaced with a mill and tree plantation. Such development would probably result in the extirpation of the local populations of *Setornis* and *M. albogulare* and the extinction of the former in Sabah.

This is paper No. 14 of the Western Foundation of Vertebrate Zoology Sabah project. I thank E. Harrison and L. Kiff of the Foundation for funding and support. D. Batchelor, D. Bishop, G. Davies, P. Engle, J. Kennard, B. King, C. Leh, M. LeCroy, A. Mack, G. Mees, W. Meijer, J. Payne, R. Paynter, J. Schmitt, R. Sims, K. Voous, D. Wells, and C. M. Yang provided help and unpublished information. I also gratefully acknowledge the Socio-Economic Unit of the Malaysian Prime Minister's Department, the Sabah Chief Minister's Department, the Sabah Forest Department (especially P. Andau), and Sabah Softwoods (North Borneo Timber and the Sabah Foundation) for permission to undertake research. The natural history museums that made specimens and data available are listed in the 'Background' section.

REFERENCES

- Anderson, J. A. R., Jermy, A. C. and Cranbrook, Earl of (1982) Gunung Mulu National Park: a management and development plan. London: Royal Geographic Society.
- Brunig, E. F. (1974) Ecological studies in the *kerangas* forests of Sarawak and Brunei. Kuching: Borneo Literature Bureau.
- Chasen, F. N. (1935) A handlist of Malaysian birds. *Bull. Raffles Mus.* 11: 1–389.
- Davies, G. and Payne, J. (1982) *A faunal survey of Sabah*. Kuala Lumpur: World Wildlife Fund Malaysia, IUCN/WWF Project No. 1692.
- Delacour, J. (1947) *Birds of Malaysia*. New York: Macmillan.
- Everett, A. H. (1889) A list of the birds of the Bornean group of islands. *J. Straits Br. Roy. Asiatic Soc.* 20: 91–212.

- Fogden, M. (1976) A census of a bird community in tropical rain forest in Sarawak. *Sarawak Mus. J.* 24: 251–267.
- Gibson-Hill, C. A. (1949) An annotated checklist of the birds of Malaya. *Bull. Raffles Mus.* 20: 3–299.
- Harrison, T. (1967) Borneo bird notes, 1966–1967, from various hands. *Sarawak Mus. J.* 15: 414–423.
- King, B. F., Dickinson, E. C. and Woodcock, M. W. (1975) *A field guide to the birds of South-East Asia*. London: Collins.
- Norman, M. M. (1964) Bird notes from the Tawau area. *Sabah Soc. J.* 2: 43–76.
- Rand, A. L. and Deignan, H. G. (1960) Family Pycnonotidae. Pp.221–300 in E. Mayr and J. C. Greenway, Jr., eds. *Check-list of birds of the world*, 9. Cambridge, MA: Museum of Comparative Zoology.
- Smythies, B. E. (1981) *The birds of Borneo*. Third edition. Kota Kinabalu and Kuala Lumpur: The Sabah Society with the Malayan Nature Society.
- Thompson, M. C. (1966) Birds from North Borneo. *Univ. Kansas Publ., Mus. Nat. Hist.* 17: 377–433.
- van Marle, J. G. and Voous, K. H. (in press) *The birds of Sumatra*. London: British Ornithologists' Union.
- Voous, K. H. (1950) On the evolutionary and distributional history of *Malacopteron*. *Sarawak Mus. J.* 2: 300–320.
- Wells, D. R. (1976) Some bird communities in western Sabah, with distributional records, March 1975. *Sarawak Mus. J.* 24: 277–286.
- Wells, D. R. (1982) Bird report: 1974 and 1975. *Malay Nat. J.* 36: 61–85.
- Wells, D. R., Marshall, A. G. and Lowry, J. B. (1975) A survey of the proposed Klias National Park, south-west Sabah. Kuala Lumpur: World Wildlife Fund Malaysia.
- Wells, D. R., Hails, C. J. and Hails, A. J. (1978) A study of the birds of Gunung Mulu National Park, Sarawak, with special emphasis on those of lowland forests. Report to the Royal Geographical Society.
- Whitmore, T. C. (1984a) *Tropical rain forests of the Far East*. Oxford: Oxford University Press.
- Whitmore, T. C. (1984b) A vegetation map of Malesia. *J. Biogeog.* 11: 461–471.
- Frederick H. Sheldon, The Western Foundation of Vertebrate Zoology, 1100 Glendon Avenue, Los Angeles, California 90024, U.S.A. Present address: Bird Department, The Academy of Natural Sciences, 19th and the Parkway, Philadelphia, Pennsylvania 19103, U.S.A.*